Organic complexation of dissolved copper

Kathy Barbeau (UC San Diego, Scripps Institution of Oceanography) plans to submit a proposal to study dissolved copper-binding ligands on samples from the US GEOTRACES Arctic Section.

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Scientific Objectives
1) Determine the concentrations and conditional stability constants of natural copper-binding organic ligand classes along the U.S. GEOTRACES Arctic section using competitive ligand exchange adsorptive cathodic stripping voltammetry (CLE-ACSV).

2) Assess the contributions of copper-binding ligands, in terms of concentrations and conditional stability constants, from aerosol dissolution, ice melt and river plumes to surface waters.

Sample Needs:
1) 500 mL – 1 liter filtered seawater from the trace metal clean GEOTRACES (GOFlo) rosette at all depths of all full water column stations
2) 500 mL seawater aerosol leachates and filtered seawater blanks, as available
3) 500 mL rain/snow precipitation samples, as available
4) 500 mL ice melt samples and ice-seawater mix samples, as available

Anticipated Scientific Collaborators:
1) PI(s) measuring dissolved copper concentrations along the section. These values are required for completing the calculations of ligand concentrations and conditional stability constants.
2) PI(s) studying copper in aerosols, precipitation and ice.
3) PI(s) studying dissolved organic matter.
4) Other PI(s) studying organic complexation of trace elements, such as iron.

Berths and Logistics:
Protocols for sample collection are expected to be similar to previous U.S.GEOTRACES expeditions, with filtered samples for copper-binding ligand studies collected from the trace metal clean GEOTRACES (GO-Flo) rosette immediately following sample collection for dissolved trace metal measurements. One berth is requested for this work, which will allow for completion of most analyses shipboard.